DEQ Montana Department of Environmental Quality

BRITISH COLUMBIA | Ministry of Environment

Draft criteria/objective Memo 2.28.17

To provide clarity and focus to the site-specific selenium standard setting process for Lake Koocanusa, BC MOE and MT DEQ have outlined below how the most sensitive species and location in the reservoir will be used in the criteria/objective setting process. Both BC MOE and MT DEQ are dedicated to protect the most sensitive species and location from harmful effects, as described below.

Montana Code Annotated states in 75-5-310 (3) that "The site-specific standards of water quality must be developed in accordance with the procedures set forth in draft or final federal regulations, guidelines or criteria."

As defined in the EPA guidance for aquatic life for selenium "The assessment endpoint for selenium is the protection of fish populations." The EPA used chronic measures of effect concentrations of EC_{10} in the 2016 Aquatic Life Ambient Water Quality Criterion for Selenium guidance document, with the effect being on offspring at a 10% effect level (ten percent of the offspring were affected when the parent was exposed to selenium in the diet (via maternal transfer)). An EC_{10} instead of the typical EC_{20} was used by the EPA because of the characteristic steep slope of the dose-response curves for selenium. Importantly, an EC_{10} was preferred over the "NOEC" or "LOEC" as these measures of effect are influenced by study design, specifically the concentrations tested, the number of concentrations tested, the number of replicates for each concentration, and the number of organism in each replicate. As noted by (Campbell, 2011), EC_{10}s and NOECs are generally of similar magnitude, but EC_{10}s have the advantage of being more reproducible than NOECs (Van der Hoeven et al, 1997; Warne and van Dam, 2008)."

BC MOE follows four main policy documents that guide the development of water quality objectives (MOE 2017). The document, Guidance for the Derivation and Application of Water Quality Objectives in British Columbia (MOE 2013) states that "it is the policy of the BC MOE that WQOs are established following the principle of avoiding the degradation of existing water quality, upgrading existing water quality, or protecting water quality for the most sensitive designated use (drinking water, aquatic life, wildlife, agriculture, recreation, industrial supplies)." This same document further states that "WQOs apply to the site in question and any potentially affected waters downstream of the site, unless otherwise stated."

"The WQOs (for aquatic life) are developed to protect individuals of the most sensitive species and all stages of their life cycle." The document outlines BCs use of site specific guidelines for sites that have atypical water quality characteristics or ecological receptors and that "third parties can contribute information which may be considered in deriving the WQOs for a given waterbody, given that the information meets the Ministry's standards and expectations."

We recommend referring to the selenium technical subcommittee the use of the EC_{10} as the endpoint pursued because of the arguments outlined by the EPA in the 2016 selenium aquatic life guidance document. BCMOE suggests protection of the most sensitive life at all life stages (MOE, 4/2013).

Because of the way that selenium moves up the food chain, lentic environments are generally more susceptible to the bioaccumulative effects of selenium than lotic environments. Because of BC's commitment to protect downstream uses, the most sensitive location of the system will be modeled and protected to ensure no harm to either the aquatic life use (or aquatic-dependent wildlife) or to the environment of Lake Koocanusa.

In this process, Lake Koocanusa will be modeled as one system, with the aim of protecting the most sensitive species and location in the waterbody.

Sincerely,

Eric Urban and Jennifer McGuire

References

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Appendix:

MT DEQ Rule making Process for Water Quality Standards (enforceable by law)

Before rules can become effective, they go through a multi-step process. Often public participation and EPA interaction occur as the rules are being written or soon after. The official process begins when DEQ goes before the Water Pollution Control Advisory Council (WPCAC) to request their feedback on the proposed rule. Next the Department requests that the Board of Environmental Review (BER) to request initiation of rulemaking which includes the official public process. WPCAC and BER are both Governor-appointed groups. WPCAC does not have rulemaking authority, but serves in an advisory capacity to DEQ (ARM 17.1.101). WPCAC is made up of eleven members representing the following interests (MCA 2-15-2107):

- Professional engineer with experience in sanitary engineering
- Irrigated agriculture
- Conservation organization
- Organic waste disposal industry representative
- Conservation districts
- Inorganic waste disposal industry representative
- Fisheries biologist
- Public works director
- Realtor representative
- Production agriculture
- Public representative

BER is the rulemaking authority for most water quality standards rules. BER is comprised of seven members representing the following interests (MCA 2-15-3502, DEQ 2017*):

- Local government planning
- County health officer/medical director
- Environmental scientist
- Hydrologist
- Attorney
- Two public representatives

When BER initiates rulemaking, the proposed rules are published in the Montana Administrative Register (MAR) along with a notice of a public hearing and official public comment period ending date (MCA 2-4-302). At least 45 days' notice of a public hearing is required for water quality standards rules (40 CFR 25.5(b)). After the public comment period closes, DEQ responds to any comments received and makes any appropriate edits to the rules (MCA 2-4-305), and then returns to BER to request adoption of the rules. Once the rules are adopted by BER, they are published in the MAR and become effective upon publication. The last step in finalizing the rules is sending the complete rule package to EPA for their review and approval or disapproval (40 CFR 131.20). EPA's review is based on several factors specified

at 40 CFR 313.5. State rules must be consistent with federal rules and regulations unless there is justification for doing otherwise (MCA 75-5-309-310).

*http://deq.mt.gov/DEQAdmin/ber/board

BC MOE Objective setting process and amendment of permits

In BC, water quality objectives (WQOs) are science-based tools that provide an effective basis for managing the resources in aquatic ecosystems and describe conditions that should be met to protect the designated uses of freshwater, estuarine, and marine ecosystems. WQOs are not legal instruments. They are developed for ambient water quality and serve as policy guidelines for MOE when issuing permits, licenses and orders that may affect water quality. They are used in conjunction with other management tools, such as waste discharge authorization processes, treatment technology, and enforcement, to achieve environmental conditions that support sustainable resource use. Once draft Water Quality Assessment and Objectives reports are completed, they are reviewed to ensure scientific rigor and consistency with Provincial policies. The final drafts are then provided to stakeholders (e.g., other ministries and jurisdictions, First Nations, non-government organizations, industry, the public) for comments and input. Once the report is finalized, it is submitted for Executive approval. Approved WQOs constitute official BC MOE policy and must be considered in any BC MOE decisions that may affect the quality of that waterbody.

The process of setting WQOs and site-specific standards for Lake Koocanusa may result in science which supports a more appropriate target for Se concentration at LK2, a site defined in Teck Coal Ltd.'s *EMA* Permit PE107517 as downstream of the Elk River in Lake Koocanusa.

To ensure protection of eco-system health, BC is prepared to take action consistent with sound collaborative science that is peer reviewed and accepted by BC MOE. If a more appropriate target is determined that is suitably protective of aquatic ecosystem health, then BC is committed to amending the long term target of 2 µg/L at LK2 in Lake Koocanusa (Shoemaker, 2014 letter a). Through the amendment provision under the *Environmental Management Act*, a Director can consider new information, such as recommendations coming from the Lake Koocanusa Monitoring and research Working Group or any further agreements made between Montana and BC, and provide responsive and timely changes to the effluent permits issued to Teck for the Elk Valley. (Shoemaker, 2014 letter b)